

IN THE CLAIMS

1. (Currently Amended) An acrylic copolymer composition comprising:
an alkyl acrylate crosslinked polymer formed by the polymerization of 5-15 weight % of a crosslinking agent and alkyl acrylate monomer; and

a non-crosslinked copolymer formed by the polymerization of 55-90 weight % of methyl methacrylate with 5-40 weight % of at least one monomer selected from the group consisting of alkyl acrylate compounds and alkyl methacrylate compounds,

wherein the weights are based on the whole weight of the crosslinking agent and the monomer components, wherein the non-crosslinked copolymer has a weight average molecular weight of 4,100,00 to 9,100,000; and

wherein the acrylic copolymer composition is prepared by a method of emulsion polymerization comprises:

(a) (i) mixing 5-15 wt% of the crosslinking agent and the alkyl acrylate monomer to prepare an emulsion containing the alkyl acrylate crosslinked polymer having the degree of swelling of 3 to 10 in tetrahydrofuran and then adding 27.5-45 wt% of the methyl methacrylate, 2.5-20 wt% of the at least one monomer selected from the group consisting of the alkyl acrylate compound with an alkyl group of 1-18 carbon atoms and the alkyl methacrylate compound with an alkyl group of 2-18 carbon atoms, an emulsifier, a polymerization initiator, and a redox catalyst, to the emulsion containing the alkyl acrylate crosslinked polymer or (ii) mixing 27.5-45 wt% of the methyl methacrylate, 2.5-20 wt% of the at least one monomer selected from the group consisting of the alkyl acrylate compound with an alkyl group of 1-18 carbon atoms and the alkyl methacrylate compound with an alkyl group of 2-18 carbon atoms, an emulsifier, a polymerization initiator, and a redox catalyst to polymerize the monomers and then adding 5-15 wt% of the crosslinking agent and the alkyl acrylate monomer to the mixture; and

(b) further adding 27.5-45 wt% of the methyl methacrylate, 2.5-20 wt% of the at least one monomer selected from the group consisting of the alkyl acrylate compound

with an alkyl group of 1-18 carbon atoms and the alkyl methacrylate compound with an alkyl group of 2-18 carbon atoms, an emulsifier, a polymerization initiator, and a redox catalyst, to the resultant mixture of step (a).

2. (Cancelled)

3. (Cancelled)

4. (Previously Presented) The acrylic copolymer composition of claim 1, wherein the crosslinking agent is selected from the group consisting of allyl methacrylate, trimethylolpropane triacrylate, and divinylbenzene.

5. (Previously Presented) The acrylic copolymer composition of claim 1, wherein the alkyl acrylate compound for the crosslinked polymer has a straight, branched, or cyclic alkyl group of 1-18 carbon atoms.

6. (Previously Presented) The acrylic copolymer composition of claim 1, wherein the alkyl acrylate compound for the crosslinked polymer is one or more selected from the group consisting of methyl acrylate, ethyl acrylate, n-butyl acrylate, lauryl acrylate, stearyl acrylate, 2-ethylhexyl acrylate, and cyclohexyl acrylate.

7. (Previously Presented) The acrylic copolymer composition of claim 1, wherein the alkyl acrylate compound for the non-crosslinked copolymer has a straight, branched, or cyclic alkyl group of 1-18 carbon atoms and the alkyl methacrylate compound for the non-crosslinked copolymer has a straight or cyclic alkyl group of 2-18 carbon atoms.

8. (Previously Presented) The acrylic copolymer composition of claim 1, wherein the alkyl acrylate compound for the non-crosslinked copolymer is one or more selected from the group consisting of methyl acrylate, ethyl acrylate, n-butyl acrylate, lauryl acrylate, stearyl acrylate, 2-ethylhexyl acrylate and cyclohexyl acrylate, and the alkyl methacrylate compound for the non-crosslinked copolymer is one or more selected from the group consisting of n-butyl methacrylate, lauryl methacrylate, stearyl methacrylate, tridecyl methacrylate, i-butyl methacrylate, t-butyl methacrylate, 2-ethylhexyl methacrylate and cyclohexyl methacrylate.

9. (Canceled)

10. (Cancelled)

11. (Previously presented) A method for preparing the acrylic copolymer composition of claim 1 by emulsion polymerization, which comprises the steps of:

(a) (i) mixing 5-15 wt% of the crosslinking agent and the alkyl acrylate monomer to prepare an emulsion containing the alkyl acrylate crosslinked polymer having the degree of swelling of 3 to 10 in tetrahydrofuran and then adding 27.5-45 wt% of the methyl methacrylate, 2.5-20 wt% of the at least one monomer selected from the group consisting of the alkyl acrylate compound with an alkyl group of 1-18 carbon atoms and the alkyl methacrylate compound with an alkyl group of 2-18 carbon atoms, an emulsifier, a polymerization initiator, and a redox catalyst, to the emulsion containing the alkyl acrylate crosslinked polymer or (ii) mixing 27.5-45 wt% of the methyl methacrylate, 2.5-20 wt% of the at least one monomer selected from the group consisting of the alkyl acrylate compound with an alkyl group of 1-18 carbon atoms and the alkyl methacrylate compound with an alkyl group of 2-18 carbon atoms, an emulsifier, a polymerization initiator, and a redox catalyst to polymerize the monomers and then adding 5-15 wt% of the crosslinking agent and the alkyl acrylate monomer to the mixture; and

(b) further adding 27.5-45 wt% of the methyl methacrylate, 2.5-20 wt% of the at least one monomer selected from the group consisting of the alkyl acrylate compound with an alkyl group of 1-18 carbon atoms and the alkyl methacrylate compound with an alkyl group of 2-18 carbon atoms, an emulsifier, a polymerization initiator, and a redox catalyst, to the resultant mixture of step (a),

wherein the weights are based on the whole weight of the crosslinking agent and the monomer components.

12. (Previously presented) A vinyl chloride resin composition comprising a vinyl chloride resin and 0.1-20 parts by weight of an acrylic copolymer composition prepared according to the method of claim 11, based on the 100 parts by weight of the vinyl chloride resin.

13. (Previously presented) A vinyl chloride resin composition including a vinyl chloride resin and 1-30 parts by weight of a mixture comprising 5-30 wt% of an acrylic copolymer composition prepared according to the method of claim 11 and 70-95 wt% of an impact modifier, based on 100 parts by weight of the vinyl chloride resin.

14. (Original) The vinyl chloride resin composition of claim 13, wherein the impact modifier is selected from the group consisting of acrylonitrile-butadiene-styrene (ABS), methyl methacrylate-butadiene-styrene (MBS), and acrylic compounds.